

OBJECTIVE 9: PLUME PROTECTIVE ACTION DECISION MAKING

OBJECTIVE

Demonstrate the capability to make timely and appropriate protective action decisions (PAD).

INTENT

This objective is derived from NUREG-O654 which provides that an ORO should have the capability to choose, among a range of protective actions, those most appropriate in a given emergency situation and base these choices on protective action guides (PAG) and other criteria, such as the nature of the reactor accident (e.g., core melt sequence), availability of shelter that provides dose reduction, weather conditions, evacuation time estimates, and situations that create higher than normal risk from evacuation. (See evaluation criteria from Planning Standards J. and N.)

Demonstration of this objective focuses on completion of the decision making process and all required ORO coordination leading to discussions on protective actions.

This objective requires input from Objective 7, Plume Dose Projection, since the results of plume dose projections provide one of the bases for protective action decision (PAD) making.

DEMONSTRATION CRITERIA

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- 1. A decision making process involving consideration of all relevant factors and all necessary coordination is utilized.**

Explanation

OROs should have the capability to make both initial and subsequent PADs. They should demonstrate the capability to make initial PADs based on notification from the licensee or from the dose assessment group (see Objective 7, Plume Dose Projection) of plant status and protective action recommendations (PAR) within the time frame specified in the plan. Field monitoring data are not expected to be available during the initial stages of a radiological emergency. Decision makers should be prepared to demonstrate the capability

to make virtually automatic PADs to protect the public when confronted with a fast-breaking emergency.

When required by scenario events, OROs should demonstrate the capability to respond to severe core-melt accidents. The Nuclear Regulatory Commission (NRC) has developed proposed guidance for licensees on PARs for severe core melt accident sequences. This guidance was provided by the NRC to FEMA in a memorandum dated October 29, 1991. This information is under review and NRC intends to issue guidance to licensees to supersede Information Notice 83-28, "Criteria for Protective Action Recommendations for General Emergencies," issued in May 1983, when a decision is made. FEMA will, at that time, incorporate the guidance into this Manual addressing protective action decision making for severe core melt accidents by State and local governments.

After initial PADs have been made, additional information should become available regarding potential or simulated releases so that subsequent improved dose projections can be made as discussed in Objective 7, Plume Dose Projection. The dose assessment group may provide additional PARs based on the subsequent dose projections. The decision group should demonstrate the capability to change PADs based on these revised projections. Generally, protective actions that have been implemented should not be relaxed based on revised dose assessments; however, PADs should be revised to require protective action in additional areas, if required.

Since PAGs are generally expressed as a range, OROs should demonstrate the capability to determine the PAG value that is appropriate for the situation. Usually, it is appropriate to implement evacuation in areas where doses are projected to exceed the lower end of the range of PAGs, except for situations where there is a high risk environment or where high risk groups (e.g., the immobile or infirm) are involved. In these cases, the upper end of the range of PAGs is usually the preferred decision criterion. Risk trade-offs between evacuation, sheltering, and radiation dose were evaluated during the development of PAG values so that risk analyses would not be required during an emergency response. Therefore, unless prior analyses have been made for specific circumstances (e.g. severe core melt accident sequence) regarding risk of evacuation versus risk from the dose that would be avoided by evacuation, or the dose that would be avoided by evacuation versus sheltering, decision makers should depend on the guidance offered by the PAGs in the plan.

Where provided for in the plan, responsible OROs should also demonstrate the capability to make decisions on the distribution of KI, as a protective measure, based on the projected thyroid dose compared with the established PAG for KI administration. It is recognized that OROs may choose to distribute, and even administer, KI prior to such a decision based on the potential for radioiodine releases. When the actual or projected thyroid dose equals or exceeds the PAG, the decision making process should involve close coordination between responsible health officials, dose assessment staff, and all other relevant personnel with

expertise. Guidance on PARs for use of KI is covered in Objective 7 and the distribution and use of KI is covered in Objective 14.

For some responsible OROs, the plan may call for joint decision making with the OROs of other jurisdictions. In such cases, OROs should demonstrate the capability to communicate and coordinate with all affected OROs in arriving at PADs. If joint decision making is not required, OROs should demonstrate the capability to communicate the contents of those decisions with all affected jurisdictions.

Extent of Play

Under this criterion, all decision making activities by ORO personnel should be performed as they would be in an actual emergency. As a general rule, it is preferable that OROs responsible for PADs participate in the exercise. If this is not possible, it is acceptable to have others play the roles of the OROs as long as it is understood that they are acting on behalf of the OROs for the exercise.

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2. All activities described in the demonstration criteria for this objective are carried out in accordance with the plan, unless deviations are provided for in the extent-of-play agreement.

Explanation

Responsible OROs should demonstrate the capability to follow policies, implement procedures, and utilize equipment and facilities contained in their plans and procedures. OROs should demonstrate that they can follow sequences outlined in the various procedures and perform specified activities, as necessary.

Extent of Play

Under this criterion, all activities should be carried out as specified in the plan, unless deviation from the plan is provided for in the extent-of-play agreement.

CLARIFICATION OF TERMS

The following definitions describe the limited meaning of terms in the context of the Exercise Evaluation Methodology and may vary from the full technical definition for all circumstances.

Evacuation time estimate is an estimate, contained in emergency plans, of the time that would be required to evacuate general and special populations within the plume pathway emergency planning zone under emergency conditions.

Monitoring refers to checking radiation levels, usually by counting ambient radiation.

Plume dose projections are estimates of dosage to the public from exposure to the plume, over a period of time, in the absence of initiating protective actions.

Projected dose is the estimated or calculated amount of radiation dose to an individual from exposure to the plume and/or deposited materials, over a period of time, in the absence of protective action.

Protective Action Guides (PAG) are projected doses to individuals in the general population that warrant the implementation of protective actions. Specific PAG's have been recommended in terms of the level of projected dose that warrants the implementation of evacuation/sheltering, relocation or protection action to reduce exposure from ingestion of contaminated food or water.

Relocation refers to a protective action, taken in the post-emergency phase, through which individuals not evacuated during the emergency phase are asked to vacate a contaminated area to avoid chronic radiation exposure from deposited radioactive material.

Special populations are groups of individuals with physical or mental handicaps that need assistance when protective actions are implemented.